

## CLAIMS:

1. A high voltage insulating material, the electrical conductivity and/or dielectric constant of which is changed by adding at least one further material such that when it is used in a high voltage device the voltage drops that occur during operation remain below flashover and/or breakdown voltages of the insulating material.

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2. A high voltage insulating material as claimed in claim 1 in solid form, wherein the further material is formed by at least essentially spherical particles which in terms of their size and/or their material and/or their coating and/or their filling and/or their fraction with respect to the overall insulating material are selected and dimensioned such that a desired electrical conductivity and/or dielectric constant of the insulating material is obtained.

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3. A high voltage insulating material as claimed in claim 2, wherein the spherical particles are hollow spheres with a diameter of up to about 100 µm.

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4. A high voltage insulating material as claimed in claim 2, wherein the spherical particles are filled with a gas.

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5. A high voltage insulating material as claimed in claim 2, wherein the spherical particles are formed of glass and/or a ceramic and/or phenolic resin and/or an acrylonitrile copolymer or another insulating material.

6. A high voltage insulating material as claimed in claim 2, wherein the spherical particles have a coating consisting of an electrically conductive material.

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7. A high voltage insulating material as claimed in claim 2, wherein the spherical particles have a coating consisting of a material that improves the adhesion between the particles and the basic substance (adhesion promoter).

8. A high voltage insulating material as claimed in claim 2, wherein the spherical particles are embedded in a basic substance to which there is added an adhesion promoter for improving the adhesion between the particles and the basic substance.

5 9. A high voltage insulating material as claimed in claim 1 in liquid form, wherein the further material for changing the electrical conductivity is formed by a first substance dissolved in a liquid basic substance.

10 10. A high voltage insulating material as claimed in claim 9, wherein the basic substance is an insulating liquid such as a transformer oil and/or an ester liquid and the first substance is an aromatic and/or an alcohol.

15 11. A high voltage insulating material as claimed in claim 1 in liquid form, wherein the further material for changing the dielectric constant is formed by a second substance that is added to a liquid basic substance.

20 12. A high voltage insulating material as claimed in claim 11, wherein the basic substance is an insulating liquid such as a transformer oil and/or an ester liquid and the second substance is a castor oil.

13. A high voltage generator comprising an insulating material in solid form as claimed in at least one of claims 1 to 8 and/or an insulating material in liquid form as claimed in at least one of claims 9 to 12.

25 14. A high voltage generator as claimed in claim 13, wherein the electrical conductivity and/or the dielectric constant of the at least one insulating material is selected such that a loading with DC voltage and/or AC voltage field strengths that is at least substantially adapted to the dielectric strength of the insulating materials can be achieved.

30 15. An X-ray system having a high voltage generator as claimed in claim 13 or 14.